

## ***Copidognathus koreanus*, a New Species of Halacaridae (Acari) from Korea**

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### **ABSTRACT**

A new species of Halacaridae, *Copidognathus koreanus* is recorded from the Korean coast mostly among intertidal coralline algae. The present new species comes close with *C. aurorae* Newell, *C. curtus* (Hall), *C. richardi* (Trouessart) and *C. unalaskensis* Newell. Morphological similarities and dissimilarities among them are discussed. This is the first report on the marine halacarid mite from Korea.

Key words: marine Halacaridae, Acari, *Copidognathus*, new species, Korea.

### **INTRODUCTION**

Halacaridae of Korea is completely unknown to science, although several works have been done from different adjacent areas like Japan (Abe, 1990a, b, c, d, 1996a, b), Hong Kong and South China (Bartsch, 1990a, b, 1991a, b, 1992a, b, c, d, 1997), the Philippines (Bartsch, 1983a, 1984a, b, 1985, 1986, 1991c). Present authors have collected many halacarid mites from different coasts of Korea. In the present communication one new species will be described here from the coast of Yeongdeok and Jeju Island, South Korea.

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## MATERIALS AND METHODS

The materials examined in the present study were collected from the algal bed mostly of coralline algae at the intertidal rocky shore of Gugye (36° 19'N, 129° 22'E), Yeongdeok and Jochon (33° 32'N, 126° 37'E), Jeju Is., South Korea.

Samplings were filtered through a nylon net (64 µm in pore diameter) after anesthetizing halacarids with 7% MgCl<sub>2</sub> solution for about 30 minutes and freshwater rinsing for osmotic shock, to be fixed and stored in 75% ethanol.

In the laboratory, the specimens extracted under a stereomicroscope were cleared in lactic acid, and then mounted in glycerin jelly for taxonomic purposes.

Type specimens are deposited in the Department of Biology, Daegu University (DB), Korea.

Abbreviations used in text: AD, anterior dorsal plate; ds<sub>1</sub>-ds<sub>5</sub>, dorsal setae 1 to 5; GA, genitoanal plate; GO, genital opening; mc, membranous cuticle; OC, ocular plate; PAS, paraambulacral setae; PD, posterodorsal plate; PE, posterior epimeral plate; PGS, perigenital setae; P1-P4, first to fourth palpal segment; SGS, subgenital setae.

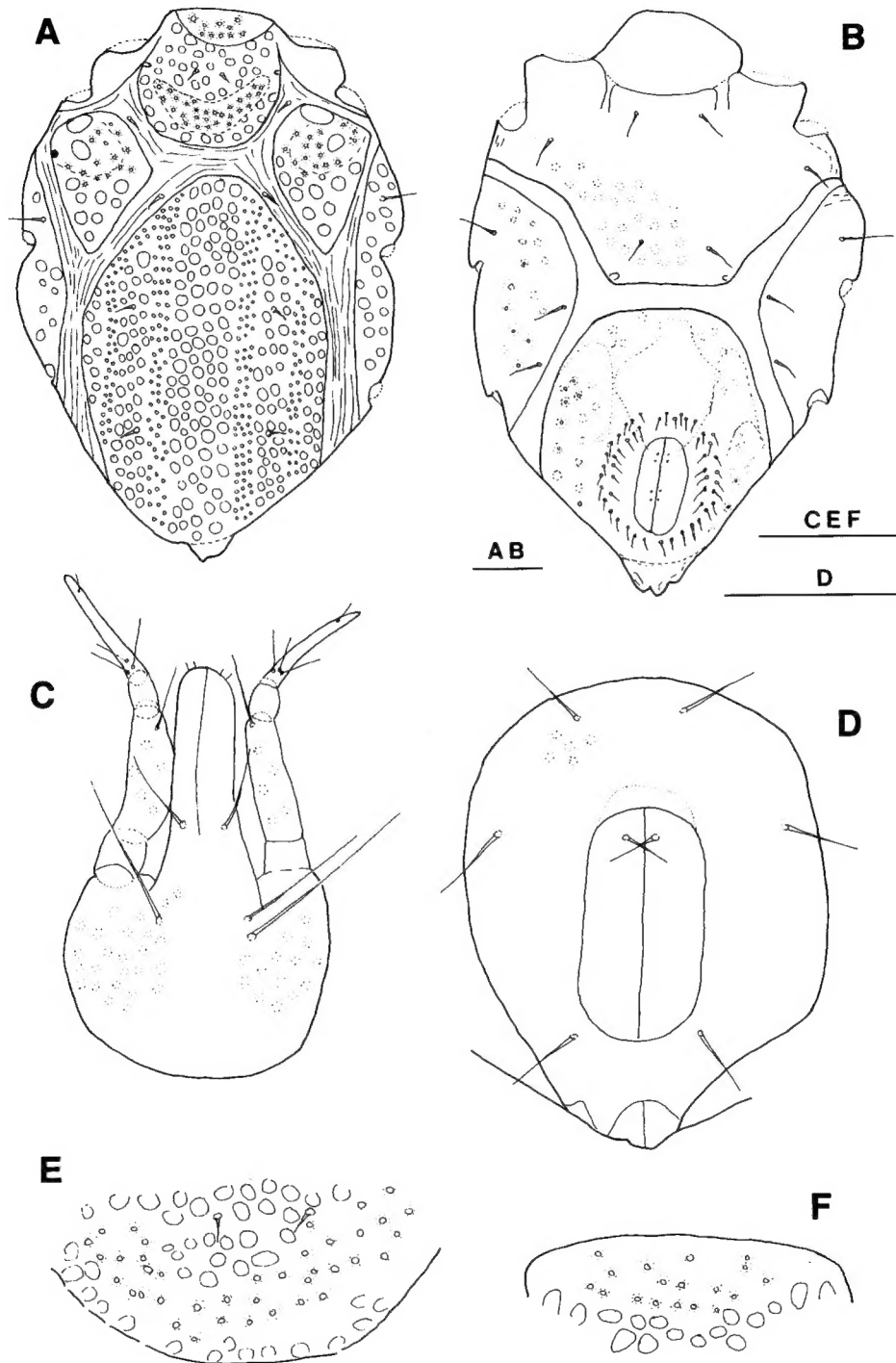
## DESCRIPTION

### *Copidognathus koreanus* n. sp. 뽕족입판물응애 (신칭) (Figs. 1, 2)

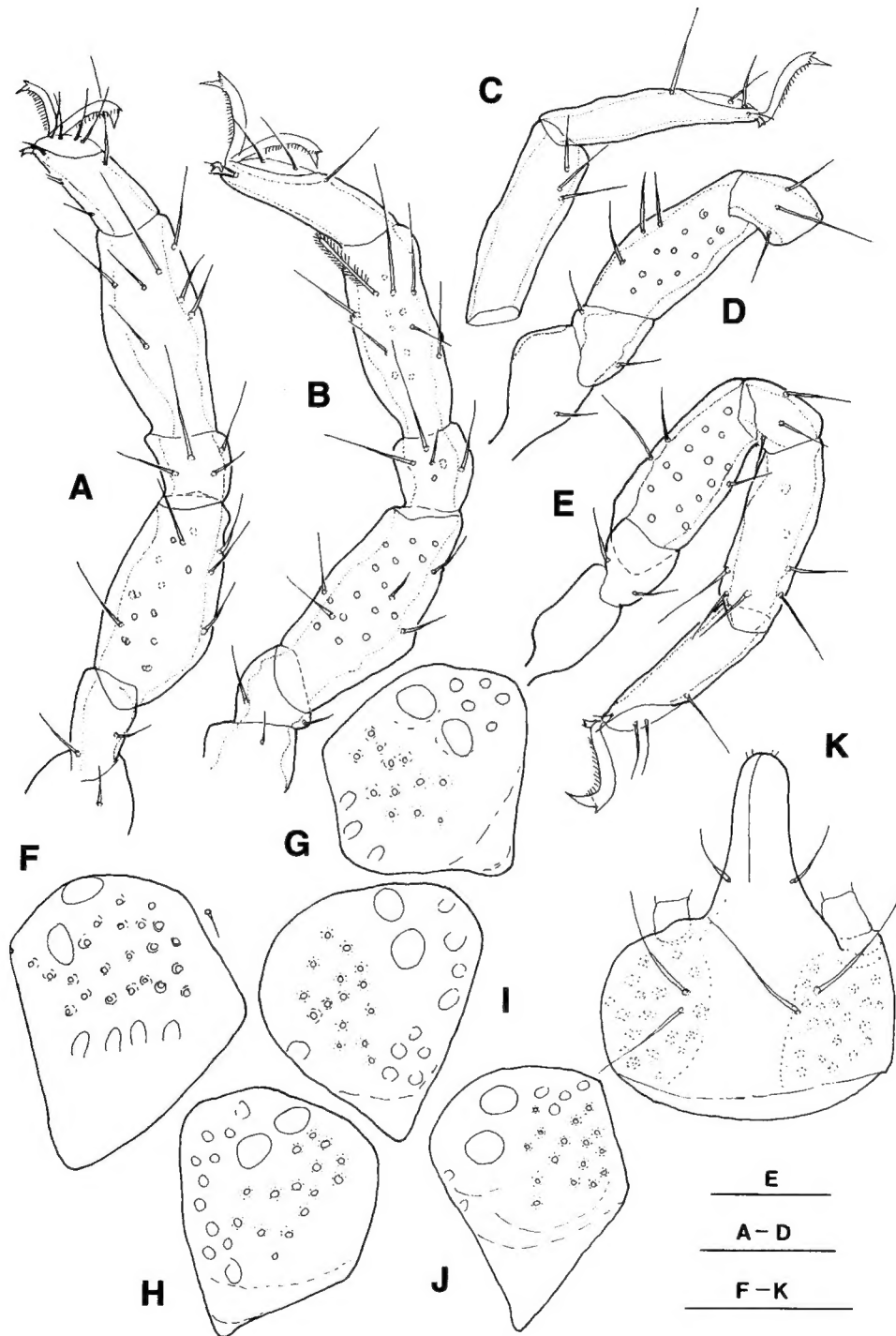
**Material examined.** Holotype: male (DB50001), Gugye, Yeongdeok, Korea, 18 April 2001, C. Y. Chang and J. M. Lee. Paratypes: one male (DB50002), two females (DB50003), same locality as in holotype, 5 January 2002, J. M. Lee. One male and one female with same collection data as in paratypes are deposited in the senior author's research collection. Two females, Jochon, Jeju Is., 25 January 2003, C. Y. Chang and J. M. Lee.

**Description.** Male. All dorsal plates separate. Idiosoma 360-374 µm long. AD with 2 porose areolae. Rest of AD containing panels. Anterior areola consisting of about 17 rosette pores (Fig. 1F). Posterior areola transversely elongated (Fig. 1E). ds<sub>1</sub> present on panelled area anterior to posterior areola. OC (Fig. 2F) 84 µm long, not caudiform posteriorly. Anterior cornea more distinct. On lateral edge of OC, a prominent gland pore present. Near corneal zone areola present medially and posteriorly (Fig. 1A). ds<sub>2</sub> just above anteromedial margin of OC, on membranous area (Figs. 1A, 2F). PD narrowing anteriorly at the first half (Fig. 1A). PD with 4 costae, consisting of 2 middle and 2 paracostae. Middle costae 3 rosette pore wide (some places 2 pores wide); paracostae 2 rosette pores wide. Area between middle and paracostae panelled. Gland pores on PD not prominent. ds<sub>3</sub> just above anterior margin of PD on membranous area. ds<sub>4</sub> and ds<sub>5</sub> situated on the panelled area between middle and paracostae. Distance between ds<sub>3</sub> and ds<sub>4</sub> 66 µm, and distance between ds<sub>4</sub> and ds<sub>5</sub> 73 µm.

All ventral plates (Fig. 1B) separate, porose. Some places of porose area containing ostia. AE with 3 pairs of setae. PE with 3 ventral setae (lateralmost one longer than other two) and 1 dorsal seta. Epimeral process not developed. About 50 PGS present around GO. Paragenital areolae



**Fig. 1.** *Copidognathus koreanus* n. sp. A, idiosoma dorsal (male); B, idiosoma ventral (male); C, Gnathosoma (male); D, GA (female); E, magnified view of posterior areola of AD; F, magnified view of anterior areola of AD. Scale bars = 50 μm



**Fig. 2.** *Copidognathus koreanus* n. sp. A, leg I (male); B, leg II (male); C, tibia and tarsus of leg III (male); D, trochanter-patella of leg III (male); E, leg IV (female); F, OC of male (left); G-H, OC of one female; I-J, OC of another female; K, gnathosoma of another male. Scale bars = 50  $\mu$ m

present. Four pairs of SGS present. GO 54  $\mu\text{m}$  long. Distance between anterior end of GO to that of GA 80  $\mu\text{m}$ , about 1.48 times of GO length. Distance between posterior end of GO and that of GA subequal to length of GO.

Palp (Fig. 1C) consisting of 4 segments. P1 12  $\mu\text{m}$ , P2 33  $\mu\text{m}$ , P3 11  $\mu\text{m}$ , P4 36  $\mu\text{m}$  long. Rostrum extending upto middle of P3. Proto- and deuterostral seta on the tip of rostrum; tritrostral seta near posterior third of rostrum. Rostral sulcus long; 2 basirostral setae present on each side of gnathosoma (Fig. 2K). In one of male specimens, only one basirostral seta present on one side of gnathosoma, while one thick and, just above it, one thin seta on the other side (Fig. 1C). Ventrolateral side of gnathosoma containing porose areolae.

Chaetotaxy of legs as follows: trochanter 1-1-1-0, basifemur 2-2-2-2, telofemur 5-5-2-3, patella 4-4-3-3, tibia 7-7-5-5. Telofemora, patella and tibiae of legs I and II with many rosette pores. Telofemora and tibiae of legs III and IV also containing few rosette pores. Telofemur IV with 1 ventral and 2 dorsal setae.

Tibia I with 3 ventral setae, all of them long, smooth and pointed (Fig. 2A). Tibia II with 3 ventral setae, two of which pointed, long, and smooth, and one pectinate (Fig. 2B). Tibiae III and IV with 2 ventral, 1 ventromedial seta. All setae long and smooth. Tarsus I with 3 dorsal setae, 1 solenidion, 2 doublet eupathidia, 3 ventral setae. Tarsi III and IV with 3 dorsal setae. In one male specimen, telofemur III with 3 setae dorsally on one side of leg, but with 2 setae on other side. In other males examined, telofemur III with only 2 setae dorsally on both sides.

All legs with 2 lateral claws and a bidentate median claw. Lateral claws with pecten ventrally. Pecten long.

**Female.** Idiosoma of female ranging from 392 to 432  $\mu\text{m}$  in length. Membranous cuticular area (mc) between different dorsal plates wider than that of male. GO (Fig. 1D) 80  $\mu\text{m}$  long; the distance between anterior end of GO to that of GA about half of the GO's length. Three pairs of PGS present; PGS long; 1 pair of SGS present. Shape of posterior portion of OC varies among specimens (Fig. 2G-J), even between OC of the same specimen. Telofemur III with 2 dorsal setae in all specimens. Only one basirostral seta present on each side of gnathosoma.

**Remarks.** The present new species comes close with *Copidognathus curtus* (Hall, 1912), *C. richardi* (Trouessart, 1902), *C. aurorae* Newell, 1951 and *C. unalaskensis* Newell, 1951.

*Copidognathus koreanus* is similar to *C. curtus* from California (Hall, 1912; Newell, 1951a) and *C. unalaskensis* from Unalaska Island, Alaska (Newell, 1951b) in having the similar type of posterior areolae on AD;  $ds_1$  anterior to the posterior areola of AD on panelled area;  $ds_2$  and  $ds_3$  situated on mc; about 50 or more PGS surrounding GO in male; tritrostral setae at the posterior half of rostrum; 2 pairs of basirostral setae in male; PD with 4 costae, of which the lateral and middle costae join together. However, the present species differs from *C. curtus* and *C. unalaskensis* due to the following points. The distance between  $ds_3$  and  $ds_4$  is longer than the distance between  $ds_4$  and  $ds_5$  in *C. curtus* and *C. unalaskensis*, while subequal in the present species. Median costae on PD are 3-5 pores wide in *C. curtus*, but 3 rosette pores wide in *C. koreanus*. Both *C. curtus* and *C. unalaskensis* possess tibia I with a pectinate seta ventrally, tibia II with 2 pectinate setae ventrally, and tibia III with a pectinate seta distoventrally, while *C. koreanus* has tibiae I and III with all ventral setae smooth and pointed, and tibia II with one pectinate seta ventrally.

*Copidognathus koreanus* also resembles *C. richardi* (Trouessart) from the North Atlantic (Trouessart, 1902; Bartsch, 1983b) and *C. aurorae* Newell from Alaska and the Arctic Ocean (Newell, 1951b) due to the presence of  $ds_2$  and  $ds_3$  on mc, tritorstral setae on the posterior half of rostrum, smooth setae of tibia I ventrally, tibia II with 1 pectinate and 2 smooth ventral setae, tibia IV with smooth ventral setae, tarsus IV with 3 dorsal setae, and telofemur IV with 1 ventral seta.

However, *C. koreanus* is easily differentiated from the above two species by the following points. Posterior areolae on AD are separated into two in *C. aurorae*, but jointed in *C. koreanus*. Areolae are present on all telofemora in *C. koreanus*, but absent in *C. richardi* and *C. aurorae*. In *C. richardi*, the distance between  $ds_3$  and  $ds_4$  is about double of the distance between  $ds_4$  and  $ds_5$ , but in the present case subequal. Paracosta and middle costa join together in *C. koreanus*, but not in *C. richardi*. The present new species is comparatively smaller in body size, that is, 360-374  $\mu\text{m}$  long in male and 392-432  $\mu\text{m}$  in female, while 558  $\mu\text{m}$  long in male of *C. richardi*, and 538-551  $\mu\text{m}$  in male and 603  $\mu\text{m}$  in female of *C. aurorae*. PGS of female relatively longer in *C. koreanus*, but smaller in *C. curtus* and *C. aurorae*.

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한국산 찐물응애과 (진드기목)의 1신종, *Copidognathus koreanus*

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요 약

한국 연안의 조간대 석회조류 틈에서 채집된 찐물응애과의 1신종 *Copidognathus koreanus*를 기재한다. 본 신종은 *C. aurorae* Newell, *C. curtus* (Hall), *C. richardi* (Trouessart), *C. unalaskensis* Newell 등과 매우 유사하다. 신종과 이들과의 형태적 유사점 및 상이점들을 고찰하였다. 이것은 한국 해산 찐물응애류를 기록한 최초의 논문이다.